

Evaluation of Oxalate Chelating Properties of Selected Egg White Proteins

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Ovalbumin, ovotransferrin, ovomucin are considered as the major egg white proteins which highly available in the egg white with remarkable functional properties such as anti-bacterial, anti-viral, metal chelating etc. Oxalate also a negative ion and anti-nutritive agent which provides precursor ions to form calcium oxalate kidney stones. According to the present studies, restriction of oxalate rich food is the main prevention factor. A very few studies have been investigated to scavenge the oxalate in the diet. Incorporating egg white proteins to scavenge oxalate will be beneficial, because egg white proteins are well known as natural proteins with many functional properties. Aim of the study was to evaluate the oxalate chelating properties of major egg white proteins: ovalbumin, ovotransferrin (Apo & Halo) and ovomucin. Oxalate (200 mg) were dissolved in 10 ml of distilled water and 0.4 g of proteins were added using triplicates separately. The samples were incubated at 4 °C for 24 hours. After centrifuging, supernatants were measured and directed to the HPLC analysis which has been carried out on RP18 column using the mobile phase of methanol: water (50: 50 v v⁻¹) with the flow rate of 1 ml min⁻¹ and detection wavelength was 237 nm at 1.35 ± 0.5 min retention time. Among the four proteins (P < 0.05), ovalbumin was reported the highest chelating of oxalate (128.43±4.56 mg) and lowest value was shown in apo-ovotransferrin (50.57±1.94 mg). Ovomucin also showed the high chelation of oxalate (94.68±4.24 mg) which less than to ovalbumin. There was a significant difference among the ovalbumin and ovomucin. Whereas the holo-ovotransferrin was shown the oxalate releasing activity. Ovalbumin and ovomucin were shown very good oxalate chelating activity, compare to the apo-ovotransferrin. Therefore, there is a potential to develop nutraceuticals to scavenge oxalate with oxalate chelating properties of these proteins.

Keywords: Oxalate, Chelating, Egg white proteins